



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/552,563

10/11/2005

Vidar Snekkenes

128.1202USN

2574

33369 7590 07/09/2008  
FASTH LAW OFFICES (ROLF FASTH)  
26 PINECREST PLAZA, SUITE 2  
SOUTHERN PINES, NC 28387-4301

EXAMINER

CALANDRA, ANTHONY J

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

07/09/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/552,563	<b>Applicant(s)</b> SNEKKENES ET AL.	
	<b>Examiner</b> ANTHONY J. CALANDRA	<b>Art Unit</b> 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☒ Claim(s) 1-8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 21, 2008 has been entered.

***Claim Objections***

1. Claims 1-8 are objected to because of the following informalities:  
  
Claim 1 is missing a verb in the modified claim limitation: 'disposed in the steam treatment vessel while the chips *are* being steamed in the steam treatment vessel'  
  
Claims 2-8 are dependent on claim 1.  
  
Appropriate correction is required.

***Claim Rejections - 35 USC § 102/103***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:  
  
A person shall be entitled to a patent unless –  
  
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
3. Claims 1, 2, 4-6 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Patent 4,436,586 ELMORE, hereinafter ELMORE.

Art Unit: 1791

As for claim 1, ELMORE discloses a method for the treatment of chips [abstract], comprising, heating the chips with steam in a steam treatment inside a steam treatment vessel [Figure 1 steaming vessel (13) and chute (14)] , adding an acidic fluid to the chips disposed in the steam treatment vessel while the ships being steamed in the steam treatment vessel in an amount that gives the chips at least a five-fold increase in an ionic concentration of hydrogen ions at the end of steam treatment compared to steam treatment without adding the acidic fluid, reducing the pH of the chips by at least 0.5 units [ $\text{H}_2\text{SO}_4$  is added to the chip and the final pH is 1.5; see e.g. Table 1 cook #3; the pH of water in the chips which is displaced by acid is between 6-7 thus the acid lowered the pH by at least 4, further pH is a logarithmic scale which measures hydrogen ion concentration, a lowering of pH by 4 is greater than a five fold increase in hydrogen ions]. Forming the chips to a slurry with an alkali impregnation fluid, conveying the slurry to a digester and cooking the chips in the digester [white liquor is added to the chips (47), where white liquor is an alkali, prior to the chips entering the digester; chips are conveyed via line (43) Figure 1].

In the alternative, should it not be clear that acid addition and steam treatment overlap during the process of ELMORE the amended claim is alternatively rejected as obvious over ELMORE. The selection of order of mixing steam first and acid second or adding steam and acid simultaneously is *prima facie* obvious absent of evidence of unexpected results [see e.g. MPEP 2144.04 (IV) (C)]. Applicant further states that ELMORE could not work as the instant application and therefore is unobvious because the removed acidic slurry phase is extracted with the alkaline phase forming an acidic/alkaline hydrolysate that needs a special recovery process. Applicant points to figure 2 to prove this point. Examiner notes that the impregnation vessel

Art Unit: 1791

shows that the middle screen is divided into two zones (27) and (38). These screens would allow acid extracted hydrolysate and alkaline hydrolysate to be separated if desired without significant modification. Secondly, ELMORE clearly states that the caustic pre-extraction is not necessary and therefore liquor extracted by line 40 would only contain acid and not be mixed with caustic [see e.g. column 1 lines 60-68, and table 1 experiment 3].

4. As for claim 2, ELMORE discloses a steaming vessel. The steaming vessel is connected in direct relation to the chip chute and therefore both are at equivalent pressures. A steaming vessel can be run at pressures up to 15 psig or 1 bar. ELMORE further discloses that the pH of the treatment is less than 4 [Table 1, experiment 3].

As for claim 4, ELMORE discloses that the liquor to wood ratio of 2:1 which does not exceed the instant claim ratio of 2:1 [see e.g. column 6 lines 42-45].

As for claim 5, white liquor [which is a sulfide rich liquor] is added to the to the chip circulation line (46) before the chips are transported to the kraft digester [see e.g. figure 1].

As for claims 6, ELMORE teaches that white liquor is used in the Kraft cook [Figure 1]. ELMORE also teaches that it is a traditional kraft cook [column 6 lines 9-15]. Normal white liquor has a sulfidity of approximately 1 mol/liter, as evidenced by applicant's specification [see e.g. pg 5 lines 25-30].

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claim 1, 2, 4-6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,436,586 ELMORE, hereinafter ELMORE and in view of, if necessary, U.S. Patent 5,635,025 BILODEAU, hereinafter BILODEAU.

Examiner argues above that some steam from the steaming vessel of ELMORE enters into the chip chute of ELMORE, thereby producing some direct simultaneous contact with the chips steam and acid. However, should the applicant successfully argue that some steam from the steaming vessel does not escape into the chip chute of ELMORE (and therefore ELMORE would not teach adding an acidic fluid to the chips disposed in the steam treatment vessel while the chips being steamed in the steam treatment vessel), examiner introduces the prior art BILODEAU. BILODEAU discloses that a conventional chip bin, steaming vessel, and chip chute can be substituted by a single vessel that performs the duty of all three separate components [abstract, column 1 lines 29-40, figure 1]. At the invention it would have been obvious to substitute the single component vessel of BILODEAU for the steaming vessel, conventional chip bin and chip chute of ELMORE. A person of ordinary skill in the art would be strongly motivated to do so because BILODEAU states that the single vessel concept, is simpler, easier to construct, easier to operate and easier to maintain [column 1 lines 40-47].

Art Unit: 1791

Should the obvious substitution of BILODEAU feed system for that of ELMORE be made, the steaming of the chips would take place at the same time acid was being directly added into the system (as the steaming vessel and chip chute are now combined).

As for claim 2, ELMORE discloses a steaming vessel. A steaming vessel can be run at pressures up to 15 psig or 1 bar. ELMORE further discloses that the pH of the treatment is less than 4 [Table 1, experiment 3].

As for claim 4, ELMORE discloses that the liquor to wood ratio of 2:1 which does not exceed the instant claim ratio of 2:1 [see e.g. column 6 lines 42-45].

As for claim 5, white liquor [which is a sulfide rich liquor] is added to the to the chip circulation line (46) before the chips are transported to the kraft digester [see e.g. figure 1].

As for claims 6, ELMORE teaches that white liquor is used in the Kraft cook [Figure 1], ELMORE also that it is a traditional kraft cook [column 6 lines 9-15]. Normal white liquor has a sulfidity of approximately 1 mol/liter, as evidenced by applicant's specification [see e.g. pg 5 lines 25-30].

As for claim 8, ELMORE teaches the acidic pre-treatment temperatures of 90 and 105 degrees C which are 2 specific points which lie in the range of 80-120 degrees C [see e.g. Table 1]. ELMORE also teaches the residence times of 45 and 60 minutes [see e.g. Table 1]. ELMORE further recognizes that the residence time is highly adjustable depending on the makeup of the wood chips, capacity of the subsequent digester, etcetera [see e.g. column 5 lines 32-36]. At the time of invention it would have been obvious to a person of ordinary skill in the art to optimize the residence time of the acidic pretreatment to 1-20 minutes to effect properties such as hemicellulose yield in the digester [see MPEP 2144.05 II].

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,436,586 ELMORE, hereinafter ELMORE and, if necessary, U.S. Patent 5,635,025 BILODEAU, hereinafter BILODEAU, as applied to claims 1, 2, 4-6 above, in further view of *Chemical Pulping* by GULLICHSEN, hereinafter GULLICHSEN.

As for claim 3, ELMORE teaches an acid pretreatment process in which acid is added (24) to the feed system impregnation vessel and digester. Some of the acid gets added by way of circulation through (16) to the steaming vessel 13 and chip chute 14. A steaming vessel can be run at pressures up to 15 psig or 1 bar which is higher than the claimed range of 0 to 0.5 bar. GULLICHSEN discloses that steaming vessels can be replaced by a single atmospheric steaming stage [see e.g. pg. A 563 section 5.3]. Since the acid of ELMORE is added first to the feed system the acid treatment would first occur at atmospheric pressure if the low pressure feeder and steaming vessel were removed. At the time of the invention it would have been obvious to a person of ordinary skill in the art to replace the steaming vessel of ELMORE with the feed system of GULLICHSEN. A person of ordinary skill in the art would have been motivated to replace the steaming vessel with the feed system since the removal of the steaming vessel leads to improved cooking uniformity, increased yield and increased strength [see e.g. GULLICHSEN, pg A565 paragraph 6].

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,436,586 ELMORE, hereinafter ELMORE and, if necessary, U.S. Patent 5,635,025



Art Unit: 1791

BILODEAU, hereinafter BILODEAU, as applied to claims 1, 2, 4-6 above, in further view of U.S. Patent 6,203,662 SNEKKENES et al., hereinafter SNEKKENES et al..

As for claim 7, ELMORE teaches that white liquor is used in the Kraft cook [Figure 1], ELMORE also that it is a traditional kraft cook [column 6 lines 9-15]. The NaOH concentration of the white liquor is greater than 0.75 mol/liter. SNEKKENES et al. teaches that a substantial amount of withdrawn liquor should be added to the beginning of the impregnation zone [column 1 lines 54-57]. This liquor is spent and the alkali content of the impregnation is 30 g/l, which is equivalent to 0.625 moles/liter [20 grams \* 1 mole/32 grams]. The sulfidity of the spent liquor would obviously be at least 0.15 moles/liter because the references provide substantially the disclosed process steps. At the time of the invention it would have been obvious to a person of ordinary skill in the art to substitute the improved kraft cooking process of SNEKKENES et al. for the traditional kraft process of ELMORE, which is subsequent to the acidic pretreatment of ELMORE. A person of ordinary skill in the art would be motivated to make this substitution because this cooking process optimizes chemical consumption, gives good heat economy and achieves good pulp properties over traditional Kraft cooking [see e.g. SNEKKENES et al. abstract].

### ***Response to Arguments***

10. Applicant's arguments filed 5/21/2008 have been fully considered but they are not persuasive. Applicant amended the claims to clearly state that the acid must be added and argues that ELMORE does not teach this feature *directly adding an acidic fluid to the chips disposed in the steam treatment vessel while the chips are being steamed in the steam treatment*

Art Unit: 1791

*vessel*. It is the examiners position that the art of ELMORE still teaches this claimed feature. ELMORE discloses that the acid needed is added to level tank (18) through line (24). The acid then circulates with the chips in feed line (21) and liquor return line (19). Acidic liquor from the high pressure feeder 15 leaves through line (16) and then can enter chip chute (14) where acid is contacted with the chips. The steam that is added in steaming vessel (13) is also present in chip chute (14) therefore the steaming and acid treatment occur simultaneously and meet the claimed limitation. Examiner points out that a steaming vessel is directly in contact with a chip chute thus as chips fall from the steaming vessel into the chute, steam necessarily escapes the vessel into the chip chute. Since steam also enters into the chip chute it also can be considered a steam treatment vessel. Applicant needs to argue against this position (argue that no steam travels with the chips from the steaming vessel into the chip chute of ELMORE and therefore ELMORE does not meet this limitation).

Should this position be successfully argued against by the applicant, examiner has introduced, if necessary, U.S. Patent 5,635,025 BILODEAU, hereinafter BILODEAU, which discloses that the steam treatment, steaming vessel, and chip tube can be combined into one single unit. With said combination the steam treatment and acid treatment of ELMORE would necessarily occur in the same vessel. At the time of the invention, absence evidence of unexpected results, it would have been obvious to substitute the three components of ELMORE for the single feed unit of BILODEAU as to obtain the benefits of a single feed system unit as described by BILODEAU.

In the alternative, should it not be clear that acid addition and steam treatment overlap during the process of ELMORE the amended claim is alternatively rejected as obvious over

Art Unit: 1791

ELMORE. The selection of order of mixing steam first and acid second or adding steam and acid simultaneously is *prima facie* obvious absent of evidence of unexpected results [see e.g. MPEP 2144.04 (IV) (C)].

Applicant argues that since acid of ELMORE travels through multiple lines (convoluted way as described by the applicant) before it ends up in the chute thus it is not *directly* added to the chip chute. Applicant is adding meaning to the word acid which is not commensurate with the claims. The fluid which is added to the chip chute of ELMORE is still acidic thus it is still directly added to the chip chute. Applicant seems to be suggesting that acid which has not been mixed with other components is added directly to the steam treatment vessel, however this is not commensurate with the claims as the applicant only describes 'an acidic fluid' which the line into the chip chute of ELMORE certainly has. An acidic fluid can be defined as any type of acidic fluid unless specified by the claims. The whole feed circulation of ELMORE lines (21), (19), and (29) is acidic thus the line (16) into the chip tube (14) is also necessarily acidic.

Applicant further argues that *mild* acid is used [column 4 lines 43-59] and as such the acid may not be sufficient for a five-fold increase in hydrogen ions. While the term mild generally connotes weak, ELMORE acting as his own lexicographer simply uses the term mild to distinguish between a process that removes some cellulosic material and a process that effects adversely the remaining cellulosic material [column 1 lines 60-69 and column 2 lines 1-5].

ELMORE suggests 0.2-0.5% H<sub>2</sub>SO<sub>4</sub> which is a strong acid. Examiner notes that a five-fold increase in hydrogen ions is only a small 0.5 change in pH. Further, the acid treatment of ELMORE is shown to have a pH in the range of 1.5 – 1.7 which clearly shows a change

Art Unit: 1791

greater than that of a pH 0.5 [Table 1] compared to the original water filled neutral conditions of the wood chips.

Applicant argues that even if sufficient there is no teaching of adding the acid at the same time as the steaming. As explained above some steam from the steaming vessel will be present in the chip shoot, thus steaming and acid treatment to occur at the same time. Alternatively, in view of BILODEAU the acid and steam would be added simultaneously if the steaming vessel, chip chute and steaming vessel were combined.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Applicant argues that it would have been unobvious to change the order of steam addition with the acid addition, that there is no teaching in ELMORE to perform direct steaming with acid addition to obtain a five fold increase in ions. In response to applicant's argument that there is a five fold increase from adding the acid directly to the steaming vessel, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

ELMORE states that the acid fluid can be added to multiple places, the level tank and to the circulation line [column 2 lines 65-69]. ELMORE also states that the acid in a long flow contact with the chips [column 4 lines 55-60] to effect acid pre-hydrolysis. Therefore it would have been obvious to a person of ordinary skill in the art to change the sequence of addition by adding the acid further upstream in the process to obtain a longer contact time, absence a showing of unexpected results. Further a person of ordinary skill in the art would be motivated to add the acid further upstream in the process to the chip bin or steaming vessel as to have a longer contact time which ELMORE discloses is an important feature of the invention.

### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571) 270-5124. The examiner can normally be reached on Monday through Thursday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1791

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJC

/Eric Hug/  
Primary Examiner, Art Unit 1791